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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : G06F 17/60, H04L 29/06, G06F 1/00 — A1

(11) International Publication Number: WO 00/62232

(43) International Publication Date: 19 October 2000 (19.10.00)

(21) International Application Number: PCT/US00/09774

(22) International Filing Date: 12 April 2000 (12.04.00)

(30) Priority Data:

60/128,846	12 April 1999 (12.04.99)	US
09/546,813	11 April 2000 (11.04.00)	US

(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

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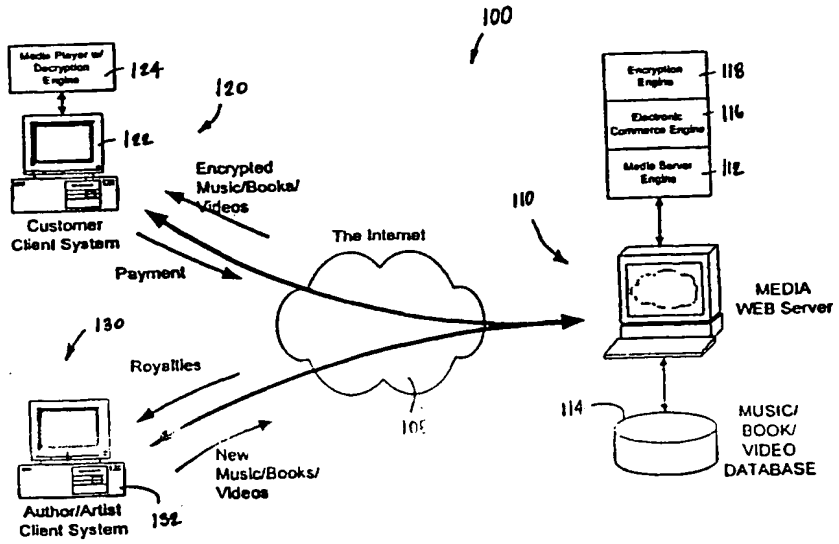
Published
With international search report.
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: SECURE ELECTRONIC COMMERCE SYSTEM



(57) Abstract

A secure electronic commerce system and method provides for the distribution of artistic works in electronic formats. The system includes a server system which permits the author or owner of a work to upload and store an electronic copy of the work and allows a plurality of client systems to access the server system to download encrypted copies of the work. The server system can also include an electronic commerce system which enables a client system to transfer value from a credit account or a debit account to an account associated with the server system in exchange for permission to download works. The server system includes an encryption system which stores a unique key for each client system and uses the key to encrypt each work download to a corresponding client system. Each client system includes an encryption system and a unique key which enables only that system to decrypt the work to all a consumer to use the work. The unique key can also be used to verify the identity of the client system.

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BNSDOCID: <WO 9623233A1 | >

SECURE ELECTRONIC COMMERCE SYSTEM

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CROSS-REFERENCE TO RELATED APPLICATIONS

This application is related to and claims the benefit of U.S. Provisional Application Serial No. 60/ 128,846, filed April 12, 1999, which is hereby incorporated by reference in its entirety.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH

Not Applicable

REFERENCE TO MICROFICHE APPENDIX

Not Applicable

BACKGROUND OF THE INVENTION

This invention relates to secure methods and systems for conducting electronic commerce and the distribution of audio, video, and text works and, more particularly, to a method and system which utilizes encryption in a client-server environment to provide secure electronic commerce transactions and the encrypted distribution of audio, video and text works for value.

Traditionally, entertainment and artistic works such as music and movies, are distributed by incorporating a copy of the work in a medium from which the work, such as a song or a movie, can be heard or viewed using a device. For example, music is distributed on records, tapes and compact discs and movies are distributed on tapes and digital video disks. The technologies associated with these media have developed over time in order to permit very high quality reproductions of the original work.

The technology also exists to convert these works into digital data that can be stored in memory in a computer or distributed via a network. This technology permits the works to be stored on digital media such as compact discs ("CDs") and digital video disks ("DVDs"). One of the disadvantages of this technology is that in order to provide a high level of sound and video quality, the works require very large quantities of memory. For example, a four minute song recorded on a CD occupies approximately 40 Megabytes of digital data in its native format, thus limiting the number songs that can be contained on a single CD and making distribution of music using the present network infrastructure impractical.

Alternative technologies have been developed which enable that same four minute song to be stored in less than 4 Megabytes of digital data. One such technology, MPEG 1, audio layer 3, which is more commonly known as MP3, defines how digital audio can be stored and transmitted using computers and networks. Other standards and technologies currently exist and still others are being developed.

These digital media technologies allow a consumer to store music in non-volatile memory such as a harddisk drive in a personal computer and use a software program, applet or plugin, commonly referred to as a media player, to play the music using the multimedia resources of a personal computer. Well known media players for MP3 technologies include WinAmp available from NullSoft, Inc. of Sedona, Arizona and

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Sonique available from Mediascience, Inc. of San Francisco, California. These products allow a user to play MP3 encoded audio on a personal computer. Other products, such as the Rio available from Diamond Multimedia, Inc. and the MPMan available from Saehan Information Systems, Inc. of Seoul, Korea, enable a consumer to store and play MP3 encoded audio in a portable device. These electronic devices typically store the MP3 encoded audio in a flash memory that allows non-volatile storage of the audio and allows the MP3 encoded audio to be erased or over written.

Digital medial technologies such as MP3 facilitate the ability to distribute audio and video via the current network infrastructure such as the internet. These technologies enable independent authors and artists to setup websites on the World Wide Web ("WWW") to distribute their works and overcome conventional barriers to distribution, which typically require the author or artist to enter into an agreement with a third party organization, such as a publishing or recording company, to promote and distribute the author or artist's work. These technologies also provide a means for the unauthorized distribution of the work.

In addition, there is no integrated system or infrastructure in place to enable music distributors, for example, to collect royalties on a per track (or per song) basis. Presently, music is distributed in album format which includes multiple tracks. There is no effective way to track which consumers were licensed which works. There is no effective way to verify the identity of consumer who is attempting download a copy of a work over a network such as the internet.

Accordingly, it is an object of this invention to provide an improved method and system for distributing audio, video and text works.

It is another object of the present invention to provide an improved method and system for distributing audio, video and text works which prevents the unauthorized distribution or redistribution of the works.

It is yet another object of the present invention to provide an improved method and system for managing the electronic commerce of the distribution of works and other goods or services over a network such as the internet.

SUMMARY OF THE INVENTION

The present invention is directed to a method and system for distributing goods and audio, video and text works over a network, such as the Internet. The method and system according to the invention allow for the transaction to occur in a secure manner which permits the distributor to verify the identity of the consumer (or customer) and impedes the unauthorized distribution of the works by the consumer (or customer) and third parties.

The system according to the present invention includes a server system which permits the owner of the work or the distributor to store and distribute the work over a network and a client system which is adapted to communicate with the server system to receive copies of the work over the network. The server system can include storage memory for storing copies of the works to be distributed or alternatively the server system can be adapted to access a storage facility which stores copies of the works, such as over a network or other data connection. The server system can also include an electronic commerce system which is adapted for receiving value (payment) from the consumer or customer and distributing that value to various parties for example the owner of the work and the authorized distributor of the work. The electronic commerce system can receive value from the consumer on either a credit basis (such as using a credit card account) or a

debit basis (such as allowing consumers to purchase credits against which they may receive works). The server system can also include an encryption system which allows the distributor to uniquely encrypt the works distributed to a consumer. Thus, the works distributed to one consumer could be differently encrypted from the works distributed to another consumer. The server system can include an encryption key database which maintains a unique key for each consumer. The unique key can also serve to allow the distributor or retailer to verify the identity of the client system (and the consumer) and to uniquely encrypt the copy of the work or any other data that is transmitted to the client system (and the consumer).

The client system according to the present invention can be adapted to interface with the above described server system to transfer value from the consumer to the distributor (and the owner) and transfer a copy of the work to the consumer. The client system can include an encryption system which is uniquely adapted to decrypt the work distributed to the consumer in possession of the client system. In one embodiment, the client system can incorporate the unique key from the server system. The client system can include several unique keys from several different server systems.

The client system according to the present invention can be adapted to interface with the electronic commerce system of the above described server to facilitate the transfer of value and enable to the distributor or retailer to verify the identity of the client system and ultimately the consumer. In one embodiment, the server system maintains a unique encryption key which is embedded (or hard coded) into the client system. The server system can verify the identity of the client system by requesting the client system to transmit a predefined message, identification code, or electronic certificate which is encrypted using the key embedded in the client system. The server system can use the unique key stored in the key database to verify the encrypted message came from the

client that is registered in the database by decrypting the predefined message and comparing it to an expected value. The same message can include other information such as a credit card information (number and expiration date) or an authorization to debit an account (including an account number). Alternatively, other known identification verification methods can be used to verify the client system.

In another embodiment, a public key encryption system can be used to encrypt the work and any messages that are transferred between the server system and to the client system. In this embodiment, the system can further include a public key server which is adapted to transmit the server system's public key to the client and the client system's public key to the server system. Digital signatures can be used by both the client system and the server system to verify the identity of the other. Public key encryption systems are available from RSA Data Security, Inc. of San Mateo, California.

In one embodiment, the client system can also include a media player adapted to enable the consumer to use to the work as permitted by the owner, such as listen to an audio work, view a video work or read text in a manner similar to the way one would read a book. Alternatively, a separate media player could be used. As used herein, the client system can reside on a personal computer or the client system can be a combination of hardware and software that is configured or adapted to perform the functions described, such as a portable device similar to a portable tape or CD player.

In an alternative embodiment of the present invention, the client and server systems can be part of a universal electronic commerce system. In this embodiment, the client system can be a universal electronic commerce client to facilitate electronic transactions over a network such as the Internet. In this embodiment, the client can be embedded into a web browser or be a "plug-in" software module that provides additional functionality to a browser or other program. The universal electronic commerce system

can include several server systems which can reside on a single system or be distributed over a network, such as a virtual private network or the internet. This embodiment can include a retailer or distributor server which is adapted to interface with the client to facilitate an electronic transaction with a consumer. The system can also include a key server which is adapted to manage the key database to transfer consumer keys to the retailer or distributor and transfer retailer or distributor keys to the consumer. In one embodiment, the key server is managed by an independent company, trusted industry organization, or the government. The system can further include a credit or debit account server which manages the various accounts, including the consumer account, the retailer account, the distribution account and the owner account. In one embodiment, the credit or debit account server can be managed by a credit card company, a bank or similar organization. Alternatively, the key distribution and credit/debit functions can be managed on the same server or jointly by one or more of the organizations identified above.

The method according to the present invention can include the following steps: The consumer or customer can use the client system to establish a connection with the server system. If the client system does not have a unique key and thus is not registered with the server system (and the owner, distributor or retailer), the client system and server system interact to enable the consumer to register with the distributor or retailer such as providing the customer name, address, telephone and even credit card information. The server system generates a unique key for the client system and transmits the unique key to the client system to use in connection with transactions with the server system. Preferably, the unique key is embedded into the software and/or hardware which makes up part of the client system, and is transmitted or delivered to the consumer. The client system which contains the unique key is now used in all subsequent transactions with the

distributor or retailer server. The consumer uses the client system to purchase a work such as a song or group of songs, such as an album, from the distributor or a product or service from a retailer. Because the client system has a unique key, the client system can be used to enter into an electronic transaction with the distributor or retailer by simply selecting the work or the good or service desired from a list, such as a menu or a web page, and manifesting an intent to enter into the transaction, such as by clicking on a button, typing a letter or word or transmitting information (such as credit/debit card or account information) to the server system. Once the consumer manifests the intent to enter into the transaction, the act can be recorded by the server system and the server system can utilize the electronic commerce system to affect the transfer of value to the appropriate parties or the server system. If the value is successfully transferred, the server system can encrypt the work using the consumer's unique key and transmit the work to the client system or in the case of hard goods or services, interact with other systems to cause the goods or services to be delivered to the consumer. In an alternative embodiment, the method and system of the invention can use a public key encryption system in which the server system uses the consumer's public key to encrypt the work to be transmitted to the client system and [illegible] decrypt and use and enjoy the work.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects of this invention, the various features thereof, as well as the invention itself, may be more fully understood from the following description, when read together with the accompanying drawings in which:

FIGURE 1 is a diagrammatic view of a system for distributing works over a network according to the present invention;

FIGURE 2 is a diagrammatic view of an alternate system for distributing works over a network according to the present invention;

FIGURE 3 is a diagrammatic view of a method of operating a media server in accordance with the present invention;

FIGURE 4 is a diagrammatic view of a method of distributing low quality copies of a work according to the present invention:

FIGURE 5 is a diagrammatic view of a method of distributing high quality copies of a work according to the present invention;

FIGURE 6 is a diagrammatic view of a method of using a media player to decrypt and play an encrypted work according to the present invention;

FIGURE 7 is a diagrammatic view of a method of searching a database for a work according to the present invention;

FIGURE 8 is a diagrammatic view of a method of demonstrating a low quality copy of a work according to the present invention;

FIGURE 9 is a diagrammatic view of a method of downloading a high quality copy of a work according to the present invention;

FIGURE 10 is a diagrammatic view of method of purchasing a copy of a work according to the present invention;

FIGURE 11 is a diagrammatic view of a method of uploading music to a distribution server according to the present invention;

FIGURE 12 is a diagrammatic view of a method of transferring value in exchange for the receipt of a work according to the present invention;

FIGURE 13 is a diagrammatic view of a method of registering a client system with a server system according to the present invention;

FIGURE 14 is a diagrammatic view of method of browsing a server system database to select a work according to the present invention; and

FIGURE 15 is a diagrammatic view of a universal electronic commerce for distributing works and conducting electronic transactions for the sale of goods and services over a network according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention is directed to a method and system for conducting secure electronic commerce transactions. In order to illustrate the application of the invention and to facilitate a better understanding of the invention, the invention is described below as embodied in a method and system for distributing music over a network such as the internet. While the invention is suited for distributing copyrightable works (such as, for example, music, audio, video and text) in electronic form, a person having ordinary skill in the art will appreciate, the invention can be embodied in a method and system for conducting electronic commerce such as retail sales over a network.

The method and system according to the invention allow customers to browse a list of music, listen to a preview, and purchase a copy of encoded music files (such as MP3 encoded files) over the Internet. In accordance with the invention, three components can be used to accomplish this task: 1) a Media Server; 2) a Remote or client system (customer); and 3) a website and associated backend system. In one embodiment, the media server is primarily responsible for distributing music to users across the Internet. In this embodiment, the system server can be a physical machine connected to the Internet and the media server can include a computer program software that runs on one or more system servers. The remote or client system can include any device (such as, a computer, personal digital assistant or portable MP3 player) that can be used for searching, playing, and purchasing music. The web site has a multi-purpose role. The web site is used for

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database maintenance and searching, credit card processing, and song playback. Each of these components utilize a database of information centrally stored on the system servers.

Figure 1 shows a system 100 for distributing music over a network such as the internet 105 in accordance with the present invention. The system 100 includes a media web server 110 such a Unix or LINUX based web server, for example Slackware Linux, installed on an Intel Corp. (Santa Clara, CA) or Digital Equipment Corporation/Compaq (Houston, TX) or Sun Microsystems SPARC (Palo Alto, CA) based computer 112. The media web server 110 is connected to the internet 105, for example by a T1 connection. The media web server 110 can include a database 114, such as a SQL compatible database created by MySQL available from T.C.X DataKonsult AB of Stockholm, Sweden. The media web server 110 can include a media server engine 112 which includes software which enables the media web server to distribute encoded music. The media web server 110 can include an electronic commerce engine 116, such a CyberCash CashRegister Payment Services available from CyberCash, Inc. of Reston, Virginia. The media web server 110 can further include an encoding/decoding engine such as an MPEG encoding/decoding engine for converting audio such as music to various levels of quality and an encryption engine for generating unique keys and encrypting music streams to be downloaded by the client. One such MPEG encoding/decoding engine is Xaudio available from MPEGTV of San Francisco, California. One such encryption/decryption engine is BlowFish available from Counterpane Systems of Minneapolis, Minnesota. Another encryption/decryption engine can be a public key - private key system such as Pretty Good Privacy available from Network Associates, Inc. of Santa Clara, California.

The system 100 can also include a customer computer system 120 to enable the customer/consumer to transfer payment to the distributor or owner and download music, videos or text. The customer computer system 120 can be any personal computer 122,

such as an Apple MacIntosh or an IBM compatible personal computer. In one embodiment, the customer computer system 120 is an IBM compatible personal computer running the Windows operating system available from Microsoft Corp., Redmond, Washington. The customer computer system 120 can also include Netscape Communicator or Microsoft Internet Explorer as the browser software used to access the web site on the Media Web Server 110. The browser can be equipped with a media player "plug-in" software module or media player computer program or applet 124 which can decrypt and decode the encrypted, MP3 encoded work (music, video or text stream) to allow the user to utilize the work. Alternatively, the media player 124 can be a stand alone application that can be enabled to access the Media Web Server 110 via the internet to browse a list of songs (videos or texts) available for download and complete the electronic transaction.

The system 100 can further include an author/artist system 130 which can permit an author, artist, musician or owner of a work to upload a work to the media web server 110. This function can be incorporated in the media player 124 on the same system that is used by the customer as discussed above or can be a separate component that is installed on separate client system 230. Like the customer client system 120, the author/artist system 130 can be any computer, such as an Apple MacIntosh or an IBM compatible personal computer 132.

Figure 2 shows an alternative system 200 for distributing music (audio, video or text) over the internet in accordance with the present invention. In this embodiment, the functions of the media web server described above can be distributed over several server systems 210 and 211. For example, the an incoming media server 211 can be provided for uploading works such as music, videos and text to a common database 214 and an outgoing media web server 210 can be provided for distributing low quality music (for

browsing) and high quality music (for purchases) to customers. The outgoing media server 210 can include a media server engine 212 to distribute music and an electronic commerce engine 216 to facilitate electronic transactions. The outgoing media server 210 can also include the encryption engine 218 and a key database which allows the high quality music to be encrypted prior to being transferred to the customer system 220 to prevent unauthorized distribution of the music.

In accordance with one embodiment of the invention, the media server is a central element of the system. The media server is primarily responsible for distributing music to users of the system. The media server can run on one or more system servers connected to the Internet. The media server is continuously running; it waits for requests from remote clients at customer systems and then processes those requests. In accordance with the inventions, there are two types of download requests the media server acts upon: (1) a request for a low quality stream, and (2) a request for a high quality stream. Both processes are handled in a similar manner, but an additional step is required for a high quality stream.

As shown in FIGURE 3, when the media server program loads, it enters the ready state at step 310 and begins listening for requests on a predefined port, such as, for example port 3005. Whenever a remote client requests a stream, the request is received at port 3005 on the system server for processing by the media server at step 312. Upon receipt of a request, the media server determines whether the received request is a request to browse or preview a song (low quality) or a request to purchase a song (high quality) at step 314. Depending upon whether the request is a request for a high quality stream or a low quality stream, the media server will initiate a process to transmit a high quality stream at step 316 or a low quality stream at step 318. Typically, the media server will begin a new process to handle the client (the remote) individually. This new process will

connect back to the remote on a different predefined port, such as, for example, port 3006 to handle the data stream. This design allows for the media server to handle simultaneous streams without any interference between them. The media server seems to be limited only by the available hardware.

As shown in FIGURE 4, when a remote client requests a low quality media stream (a browse), the media server responds by creating a new process to serve the request at step 412. This process identifies the stream requested and opens the appropriate low quality file on the server at step 414. The media server then begins to send the file in packets across the Internet to the remote client at step 416. This process continues sending packets until either the end of the file is reached, or the connection to the remote client is lost at step 418. When the process terminates at step 420, it returns the media server to its previous state.

As shown in FIGURE 5, when a remote client requests a high quality stream (a purchase), the server reacts responds in a similar manner. The server again creates a new process to handle the request at step 512. Because this file will be written to disk for multiple playbacks, the file is opened at step 514 and the file is encrypted so it can not be distributed after it has been purchased. This is accomplished by using the unique registration or key number assigned to the remote client. This information is then used to encrypt the file as it is being sent to the customer in step 516. Again, the process continues until the entire file has been sent to the remote client at step 518. After the process is finished, it returns the server to its previous state at step 520.

The remote client can be a program that resides on the user's computer. The remote client can include the functionality to play MPEG or any other encoded music file, search the music database at the website, request music streams from the media server, and allows purchasing of music. Except for the playback of local (on the hard drive)

MPEG music files, all other processes require an Internet connection to communicate with the servers. There are two types of the remote client: (1) a basic player client which is limited by not allowing the purchase of songs, and (2) a registered player client which has all of the functionality required to use purchase and upload music to the system servers. After a user has downloaded the basic player client, they can register the client. This registration process is performed through the web site, and provides the information needed to process transactions (transfer value), and assigns a unique key to be used in the encryption and decryption process for purchased music. When a user has completed the registration process, a custom version of the registered player client is downloaded to the user's computer.

Song playback is handled by song lists at the remote client. A customer can create custom song lists from low quality streams, purchased songs, and any non-encrypted audio file on the customer's computer. As shown in FIGURE 6, when a song is played, the remote client checks to see if the file is a local file at step 612 and if so, the remote opens the file at step 622, and passes it to the MPEG decoder. The decoder takes the file and decompresses it for playback, and then plays it. If the song is a purchased audio file at step 618, the file is first decrypted at step 620 and then passed to the decoder at step 622. If the file is not a local file at step 612, the remote client initializes a process to download a low quality stream at step 614. In one embodiment, the MPEG encoder/decoder is the X audio MPEG audio engine available from MPEGTV, LLC of San Francisco, California.

The song lists used by the remote client can be created from local files, or streams from the system server. As shown in FIGURE 7, when a customer wishes to add a stream to the song list, the information needed to play the song is retrieved through a search of the database. When a customer enters a query, by band name for example, the

remote client must pass the request to the system server. The remote client connects to the system server at step 712 and passes the request to the system database at 714. The database then performs the search and passes the information back to the remote client where the information can be added to the song list at step 716 before closing the connection at step 718.

As shown in FIGURE 8, when a user requests a low quality stream (a browse) from the media server at step 812, the media server can establish a separate connection to the remote client for the purpose of transmitting the music data to the remote client. As the remote client receives the information from the media server, it is passed to the MPEG decoder at step 814 for playback. At this point the stream is treated as if it were a local file. As the information is retrieved from the media server, it is stored in memory. The information is never written to disk because it is intended that the song will not be stored permanently on the user's machine. In one embodiment, the low quality stream is a 24Kb/s, 22KHz MP3 encoded stream or lower quality.

A shown in FIGURE 9, when a customer requests a high quality stream (a purchase) at step 918 from the media server, the process is similar to a browse. A high quality stream is initiated in step 912 and the song is downloaded. A purchased song is not played as it is downloaded. Because the file is purchased, the file is stored in its encrypted form on the memory of the customer's system in step 914. This allows the customer to listen to the file without the need to be connected to the Internet. In one embodiment, the high quality stream is a 128kb/s, 44.1KHz MP3 encoded stream or better quality.

As shown in FIGURE 10, customers can purchase songs with the remote client. Customers must first purchase points from the web site before purchasing songs. When a customer buys a high quality sound file, the remote handles the transaction. A connection

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is established to the database on the system server in step 1012. The remote client checks the database for points to purchase the song at step 1014. If a customer has points available at step 1016, the number of points is automatically updated in the database at step 1020, the database connection is closed at step 1022, and the remote client initiates a high quality stream from the media server at step 1024. If the customer doesn't have enough points at step 1016, the customer is informed of the deficiency and the process is terminated at step 1018.

As shown in FIGURE 11, musicians can upload their music to the database using the remote client. The musician needs only a high quality audio file such as a 128 kb/s, 44.1 kHz, Stereo MP3 file and a musician account in the database. A musician account can be created on the web site by a registered customer. When the process begins, the musician can be prompted to select the items to be uploaded at step 1110 and to input information about the song at step 1112. This information can be stored and later used in searches of the database. The remote client then connects to the database at step 1114, updates the information in the database at step 1116, and uploads the file to the system server at step 1118. After the song upload is complete, the database connection is closed at step 1120. Once the file is saved on the server, a separate process can be used to create the low quality file at step 1122. For example, the high quality file is decoded into .wav format, then encoded into a low quality (24 kb/s, 22 kHz, Stereo) MP3 and saved. The song will be available once it has been checked for errors.

The web site provides a range of functionality to both customers and musicians. Some of the functions the web site can perform are: (1) To collect a variety of user information, (2) Credit card processing, (3) Client registration, and (4) Generating listings from search of the database. Information can be collected throughout the web site using HTML forms and stored in the database. Credit card processing can be handled through a

3rd party service, such as cyber cash payment services available from Cyber Cash, Inc., Reston, Virginia. Client registration provides the customer with a fully functional remote client that can be used to purchase music. The band information features, musician listings and musician information, rely on querying the database for information, and presenting it to the user.

One portion of the e-commerce system is credit card processing. As shown in FIGURE 12, when the customer purchases points, the customer must select a payment method at step 1210 and enter the transaction information such as credit card information to complete the transaction at step 1212. Points can be used to purchase songs. The number of points a user currently has is tracked in the database. Unlike the rest of the web site, the credit card processing pages use secure sockets (SSL) to handle the communications. The web site sends the appropriate information to a 3rd party service for authentication at step 1214. When a response is received from the authentication service, if the transaction is approved at step 1216, the program updates the database at step 1220 and if the transaction is not approved, and informs the user of the result of the transaction.

Although a customer can browse music and play MP3 files with the basic remote client, a customer must have a registered remote client to purchase high quality files. As shown in FIGURE 13, when a customer wishes to register at step 1310, they provide general information about themselves for use by the distribution source at step 1312. After this information is stored in the database at step 1314, a unique key is assigned to the customer for use in the encryption and decryption process of the high quality sound files at step 1316. A custom registered remote client program is then created with the appropriate registration information and sent to the customer at step 1318. A customer can now purchase high quality sound files and listen to them.

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The artist and band listings provide the customer with the ability to locate artists and bands based upon a variety of criteria. The artist/band listing is maintained by the website backend. When a search is passed to the backend, it first establishes a connection to the database. When the connection is established, the backend sends the request to the database and waits for a response. As the information is returned from the database, it is formatted according to template files. These templates provide instructions for how the information is formatted in standard HTML. The generation of artist/band listings can be initiated by: (1) custom searches of the database from the web site, or (2) changes to the database.

In addition, as shown in FIGURE 14, a customer can also initialize a browse function from the web site at step 1410. When a customer selects a song from the web page, the web backend sends a file associated with the remote to the user's web browser at step 1412. When the web browser receives this file, it automatically launches the remote client at step 1414. This file contains instructions that initiate a low quality stream of the song selected from the web site.

Figure 15 shows a system 1500 for conducting electronic commerce over the internet in accordance with the present invention. In this embodiment, the system includes a plurality of servers 1510, 1520, 1530 and a universal electronic commerce client 1550. The client 1550 can include a web browser 1554 which is configured to include a unique encryption key or other unique identifier 1556 which is used for all electronic transactions with a retail web server 1530 which allows for the secure purchase of goods, services or works (audio, video or text). The retail web server 1530 can include any computer server coupled to a retailer/distributor database 1532 that is used in electronic transactions for the sale of goods, services or the distribution of audio, video or text works. The system 1500 can also include a key encryption system in which the

client's unique private key is stored in an independent, trusted public key server 1520 and associated key database 1522 which can only accessed by authorized retailer or distributor servers. The system 1500 can also include a credit/debit web server 1510 which permits the customer to establish an account and provides for the transfer of value (payment) in exchange for works downloaded. The credit/debit web server 1510 can include a credit/debit database 1512 in which customer, retailer, distributor and owner accounts can be stored.

As one of ordinary skill will appreciate, the system of the present invention can be used to distribute works (audio, video or text) in a business to business context as well as a business to consumer or customer context. For example, music can be distributed for use in offices, waiting rooms and elevators using the above identified system. In this embodiment the music can be downloaded as needed based on a predefined program or downloaded and stored for later playback according to a predefined program. Alternatively, the browse mode can be used to receive predefined or random streams of music for use in offices, waiting rooms or elevators, etc.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of the equivalency of the claims are therefore intended to be embraced therein.

What is claimed is

1. An apparatus for distributing a units of information representative of copyrightable works over a network, said apparatus comprising:

an information database adapted for storing said units of information representative of copyrightable works;

a media server, connected to said information database, including a computer system, associated memory, and media server software, said media server software being adapted to retrieve said units of information from said information database and to transmit said units of information to a plurality of client systems over said network;

an encryption engine connected to said media server and adapted for processing each of said units of information to create encrypted units of information according to a unique key for each client system.

2. An system for distributing a units of information representative of copyrightable works over a network comprising:

an information database adapted for storing said units of information representative of copyrightable works;

a media server, connected to said information database, including a computer system and associated memory, said media server including media server software, said media server software being adapted to retrieve said units of information from said information database and to transmit said units of information to a plurality of client systems over said network;

an encryption engine connected to said media server adapted for processing each of said units of information to create encrypted units of information according to a unique key for each client system;

a client system including a computer system, associated memory, and client

software, said client software being adapted for communicating with said media server to receive said encrypted units of information from said media server;

said client system including a reader adapted for decrypting and presenting said information to an end user;

wherein said reader includes a unique key adapted decrypting said encrypted units of information and said media server is adapted for encrypting said units of information according to at least one key that is unique to the reader of each client system.

3. A method of distributing units of information representative of copyrightable works over a network comprising the steps of:

storing each of said units of information in a database;

upon request from a client system for a particular unit of information, retrieving said unit of information and encrypting said unit of information using a key unique to said client system; and

transferring said encrypted unit of information to said client system.

SDOCID: <WO 0062232A1 | >

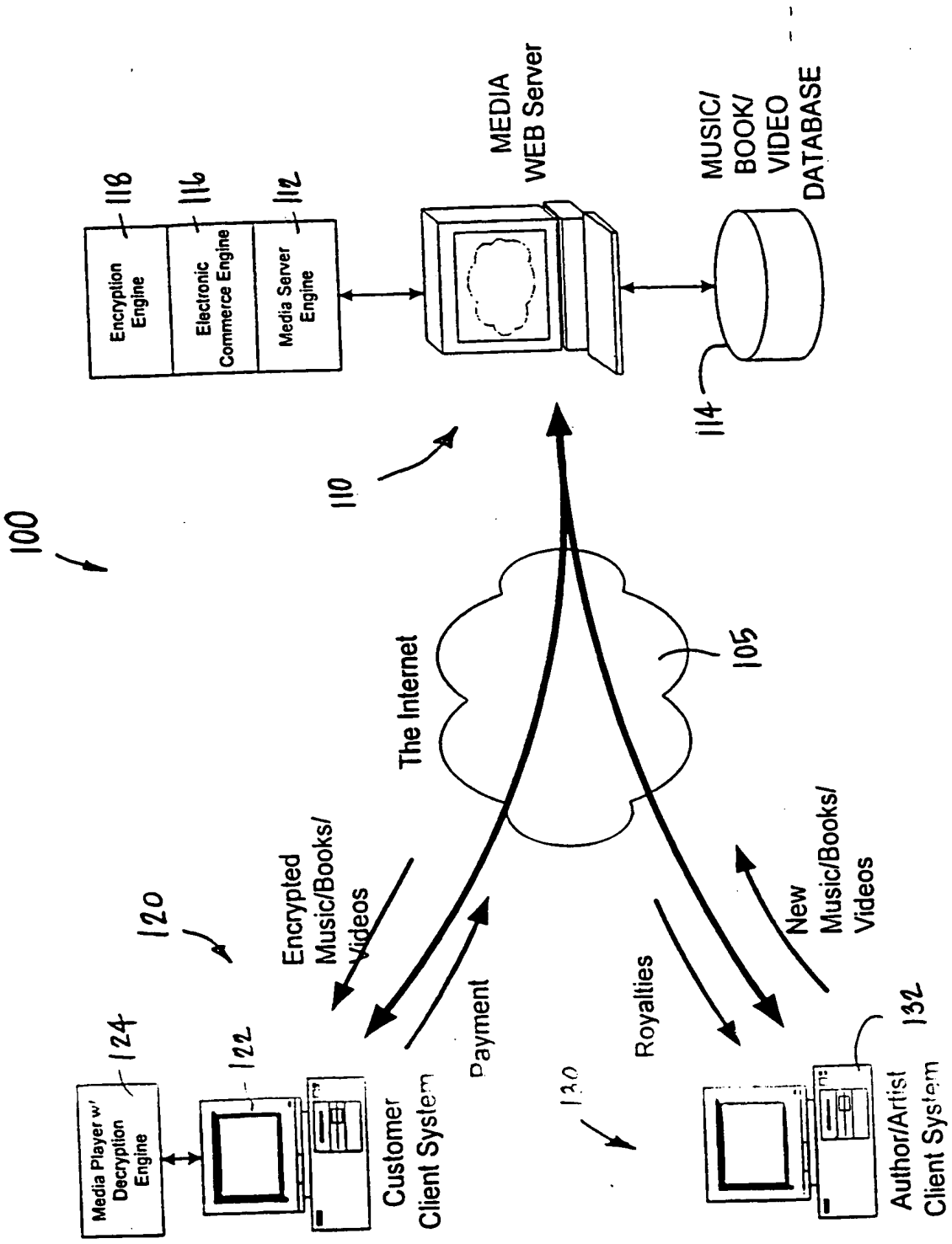
100
110
MEDIA WEB Server
MUSIC/ BOOK/ VIDEO DATABASE
114
Encryption Engine
Electronic Commerce Engine
Media Server Engine
118
116
112
The Internet
105
Encrypted Music/Books/ Videos
Payment
Royalties
New Music/Books/ Videos
120
122
124
Media Player w/ Decryption Engine
Customer Client System
130
132
Author/Artist Client System

FIG. 1

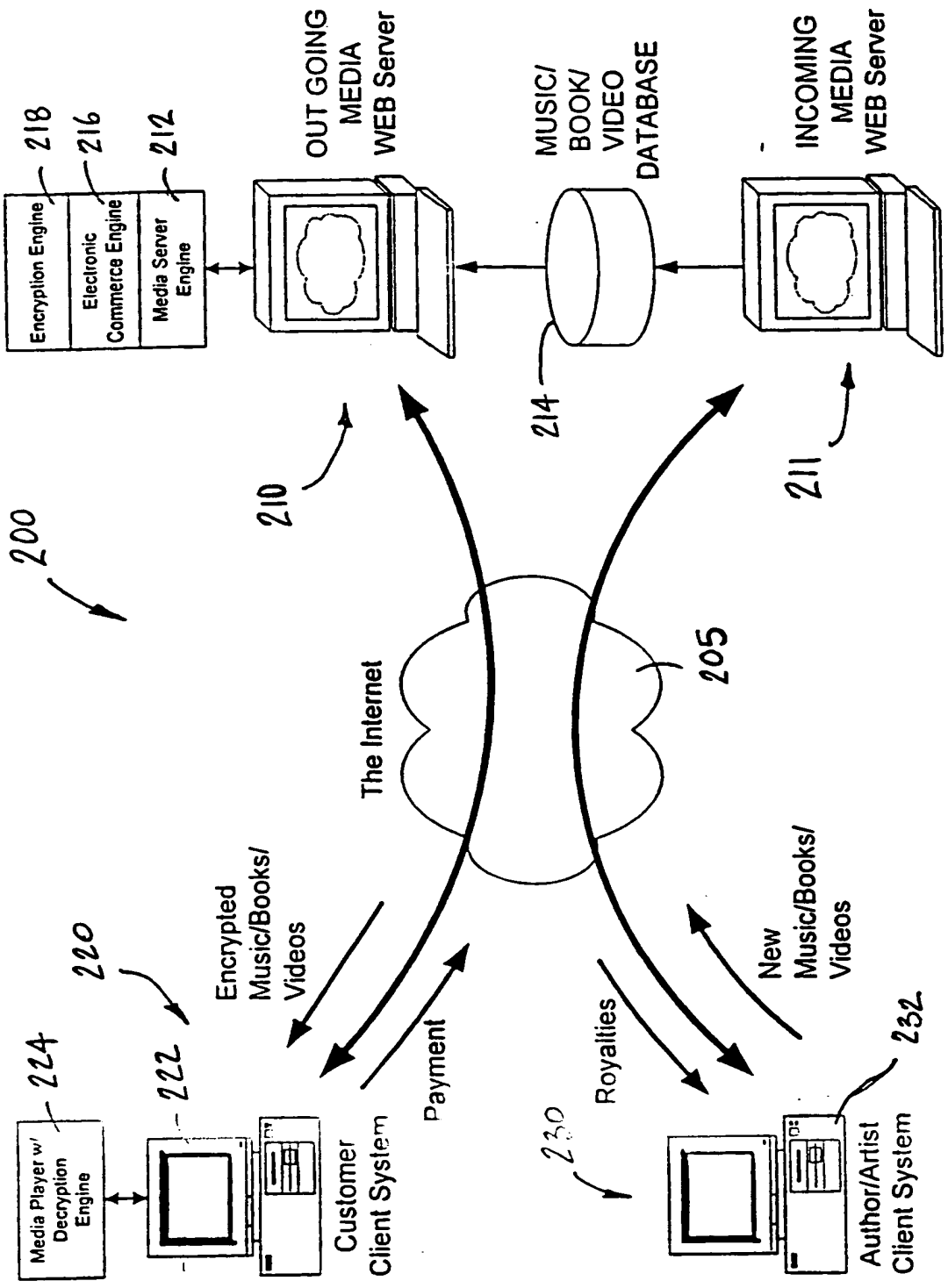

FIG. 2

ENSDOCID: <WO___0062232A1_I_>

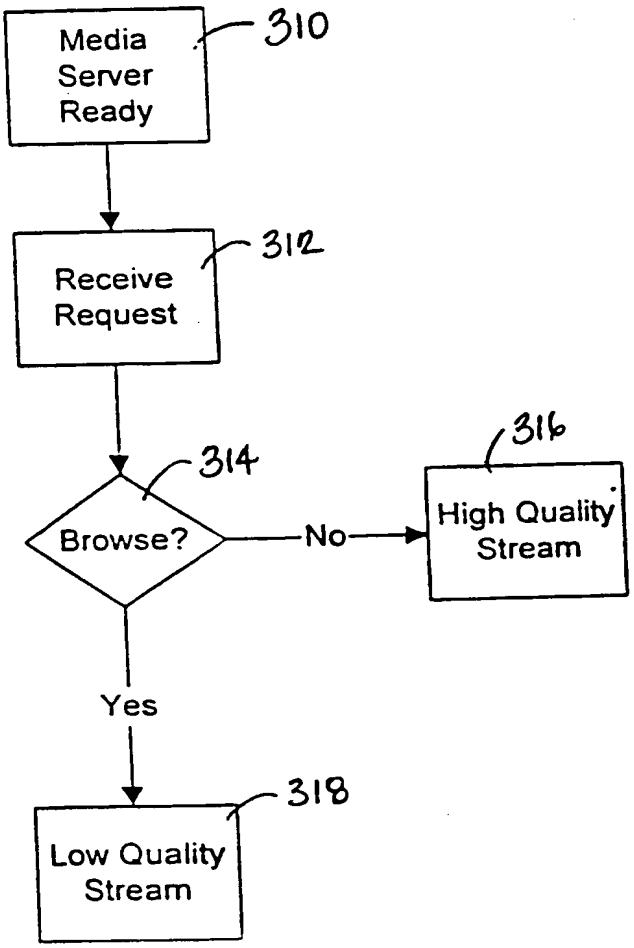
Media Server Ready
310
Receive Request
312
Browse?
314
No
High Quality Stream
316
Yes
Low Quality Stream
318

FIG. 3

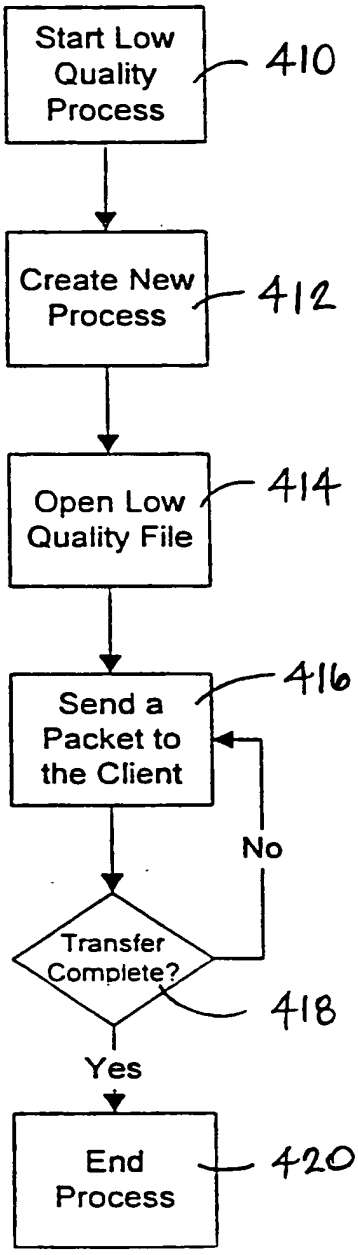
Start Low Quality Process
410
Create New Process
412
Open Low Quality File
414
Send a Packet to the Client
416
No
Transfer Complete?
418
Yes
End Process
420

FIG. 4

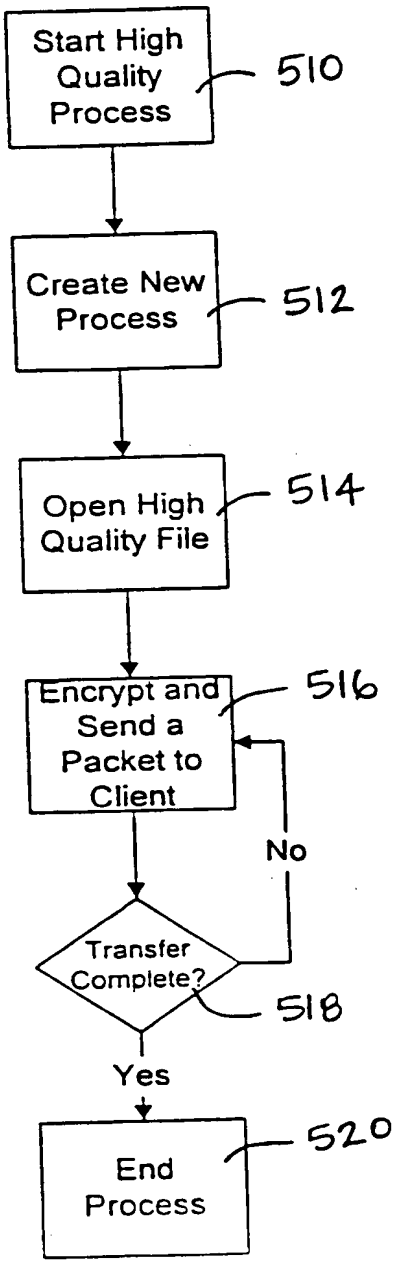
Start High Quality Process
510
Create New Process
512
Open High Quality File
514
Encrypt and Send a Packet to Client
516
No
Transfer Complete?
518
Yes
End Process
520

FIG. 5

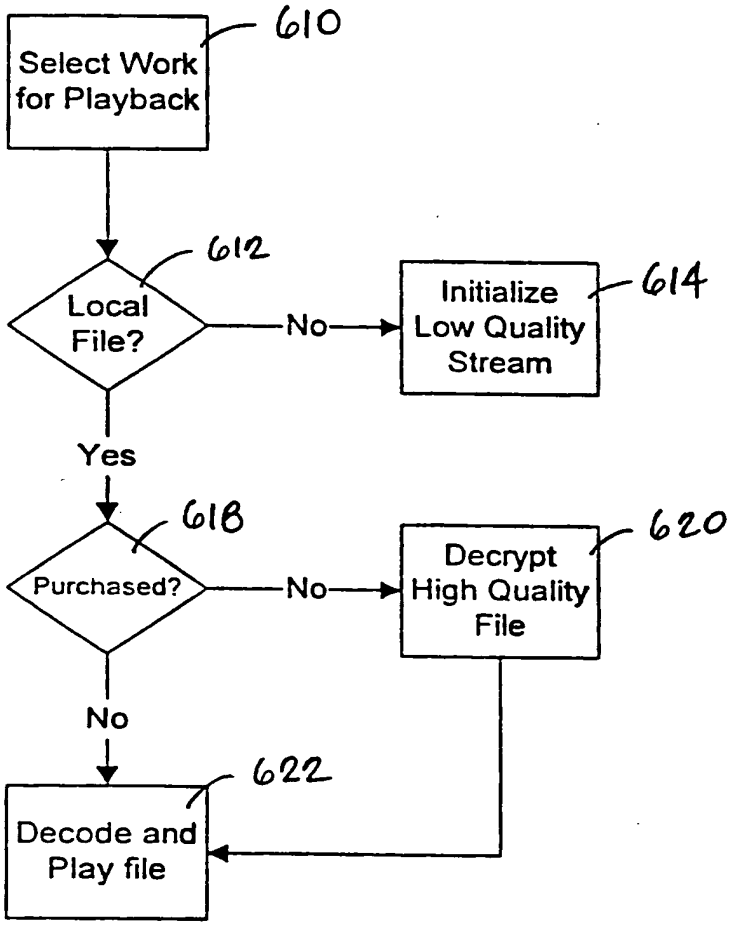

FIG. 6

3NSDOCID: <WO___0062232A1_I_>

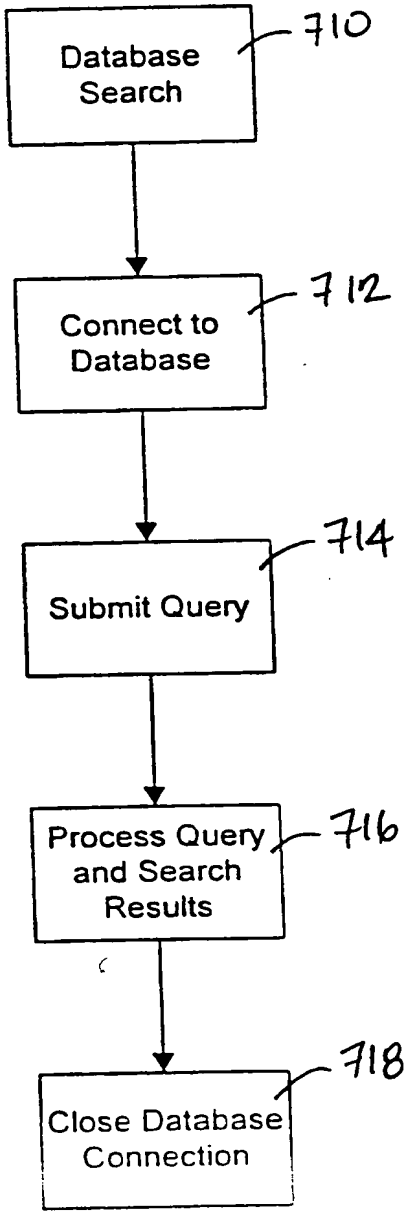
Database Search
710
Connect to Database
712
Submit Query
714
Process Query and Search Results
716
Close Database Connection
718

FIG. 7

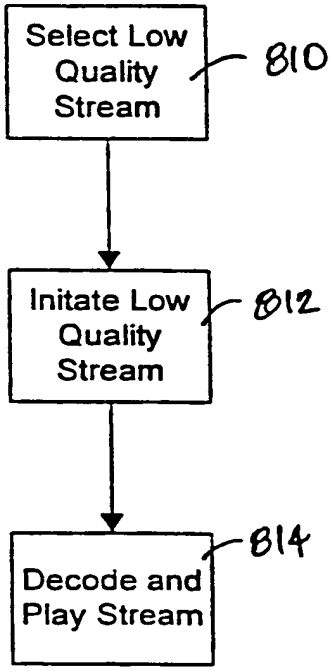

FIG. 8

3NSDOCID: <WO___0062232A1_I_>

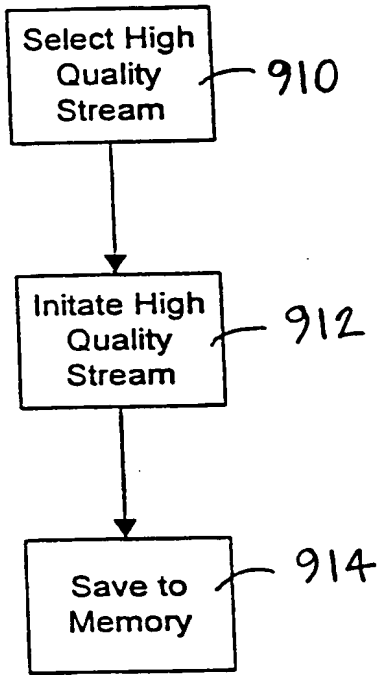
Select High Quality Stream
910
Initate High Quality Stream
912
Save to Memory
914

FIG. 9

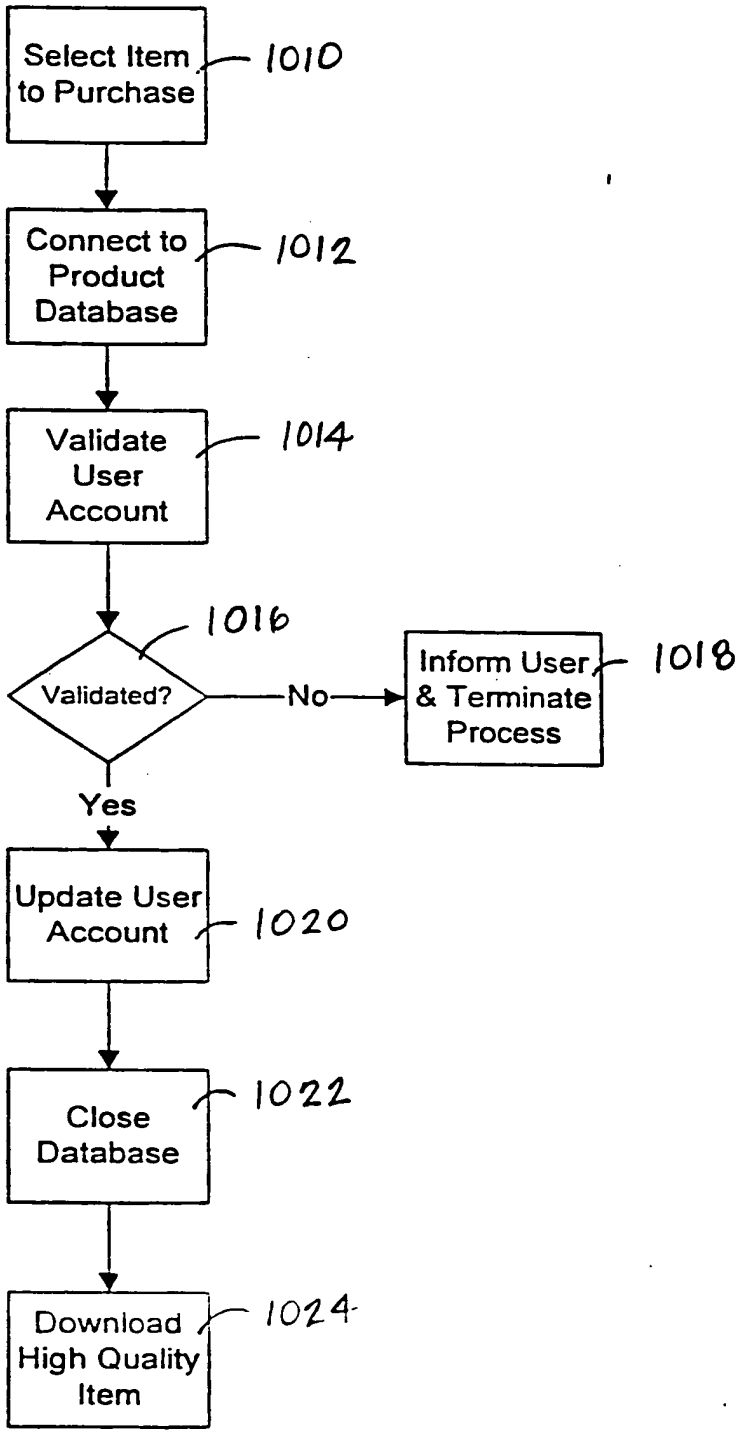

FIG. 10

NSDOCID: <WO___0062232A1_I_>

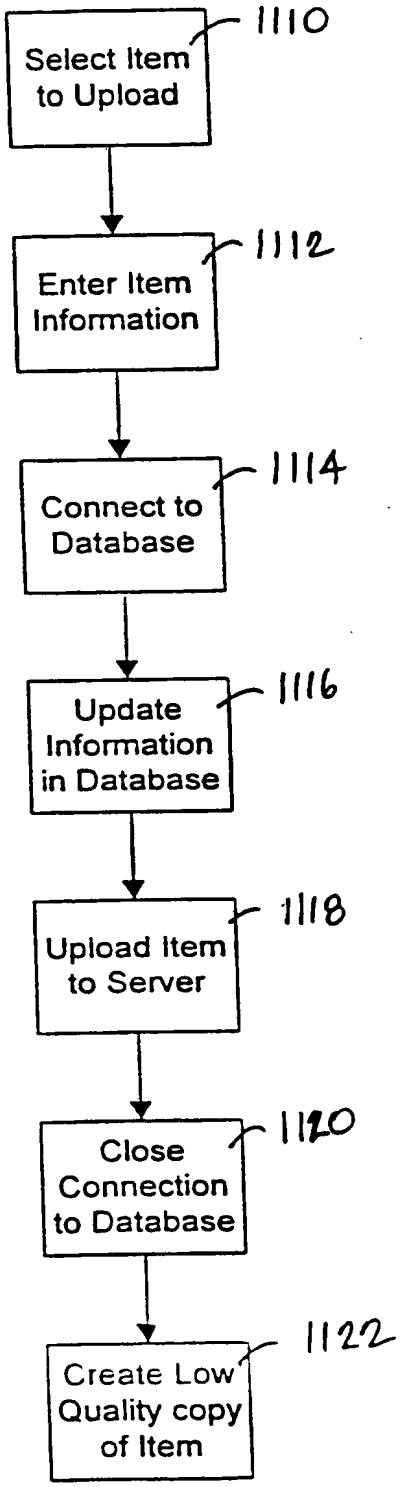
Select Item to Upload
1110
Enter Item Information
1112
Connect to Database
1114
Update Information in Database
1116
Upload Item to Server
1118
Close Connection to Database
1120
Create Low Quality copy of Item
1122

FIG. 11

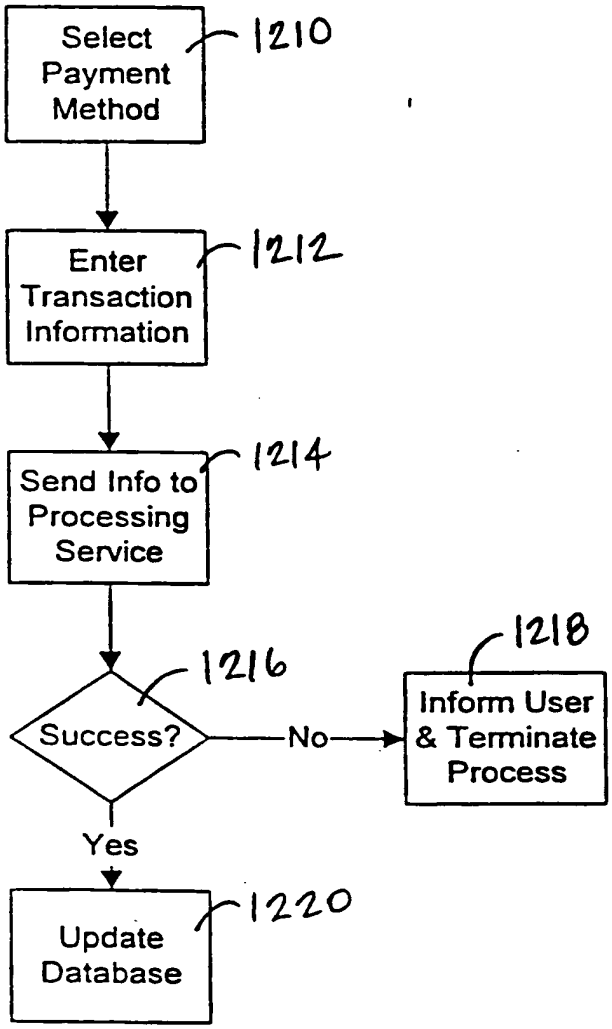

FIG. 12

BNSDOCID: <WO___0062232A1_I_>

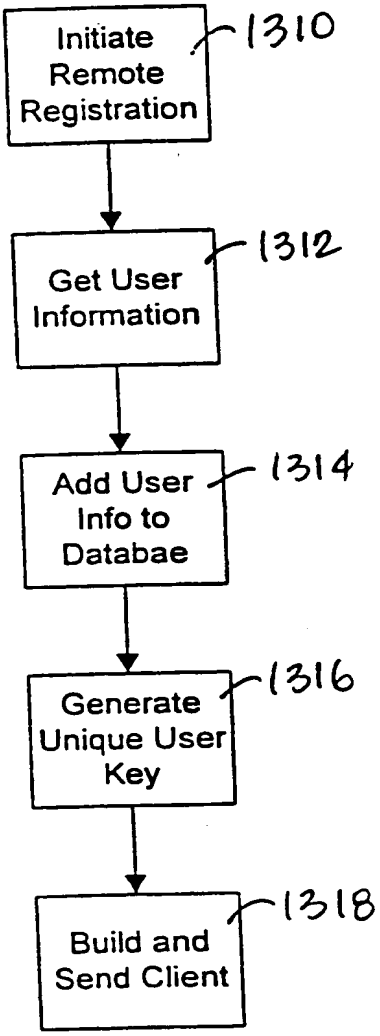
Initiate Remote Registration
1310
Get User Information
1312
Add User Info to Databae
1314
Generate Unique User Key
1316
Build and Send Client
1318

FIG. 13

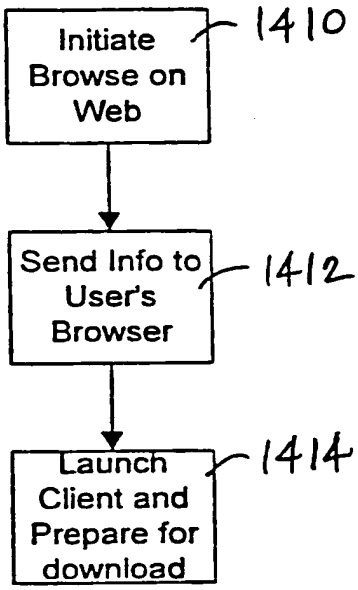

FIG. 14

ENSDOCID: <WO 0062232A1_I_>

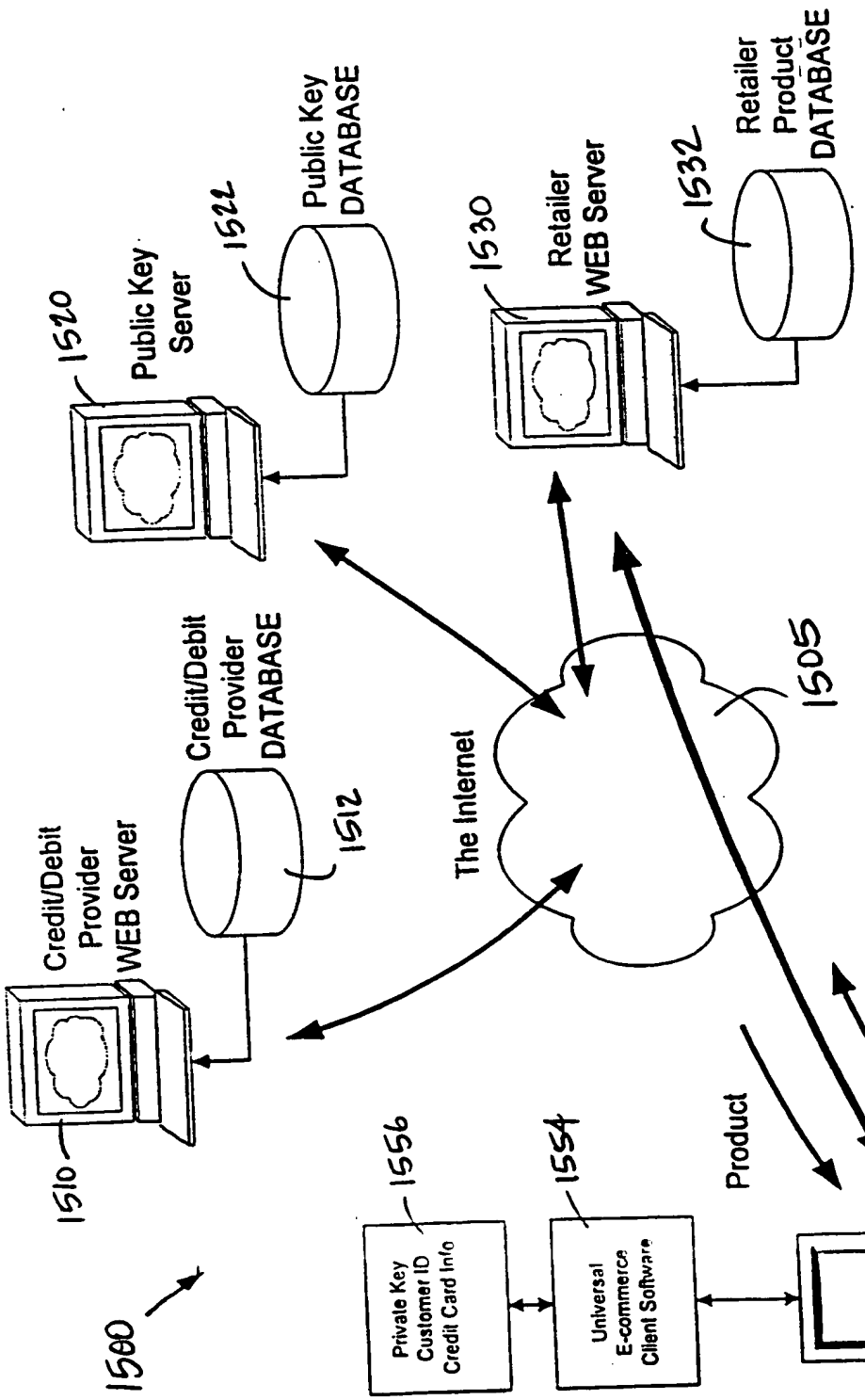
1500
1510
Credit/Debit Provider WEB Server
1512
Credit/Debit Provider DATABASE
1520
Public Key Server
1522
Public Key DATABASE
1530
Retailer WEB Server
1532
Retailer Product DATABASE
1505
The Internet
1550
Payment
Product
1552
Universal E-Commerce Client
1554
Universal E-commerce Client Software
1556
Private Key Customer ID Credit Card Info

FIG. 15

INTERNATIONAL SEARCH REPORT

Int ional Application No
PCT/US 00/09774

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G06F17/60 H04L29/06 G06F1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04L G06F G07F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 843 449 A (SUNHAWK CORP INC) 20 May 1998 (1998-05-20) column 2, line 12 -column 4, line 5 column 5, line 9 - line 25 column 5, line 53 -column 8, line 19 column 9, line 11 - line 30 column 10, line 30 -column 11, line 36 figures 1,3-5 --- -/--	1-3

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 August 2000	06/09/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Carnerero Álvaro, F

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3NSDOCID: <WO___0062232A1_I_>

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 00/09774

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	CHOUDHURY A K ET AL: "COPYRIGHT PROTECTION FOR ELECTRONIC PUBLISHING OVER COMPUTER NETWORKS" IEEE NETWORK: THE MAGAZINE OF COMPUTER COMMUNICATIONS,US,IEEE INC. NEW YORK, vol. 9, no. 3, 1 May 1995 (1995-05-01), pages 12-20, XP000505280 ISSN: 0890-8044 page 14, right-hand column, paragraph 5 -page 18, right-hand column, paragraph 6 ---	1-3
A	BALASUBRAMANIAN R ET AL: "TOWARD OBJECT-WEB BASED SERVICE PROVIDER INFRASTRUCTURE FOR E-COMMERCE TRANSACTIONS" ISS. WORLD TELECOMMUNICATIONS CONGRESS. (INTERNATIONAL SWITCHING SYMPOSIUM),CA,TORONTO, PINNACLE GROUP, 21 September 1997 (1997-09-21), pages 105-112, XP000704461 figures 1,8 ---	1-3
A	NAGASAKA A ET AL: "GENERAL PURPOSE MEDIA SERVER CONFORMING TO DAVIC: OKI MEDIA SERVER V2" OKI TECHNICAL REVIEW,JP,OKI ELECTRIC INDUSTRY, TOKYO, vol. 63, no. 159, 1 July 1997 (1997-07-01), pages 11-16, XP000699912 ISSN: 0912-5566 page 11 ---	1-3
A	ME L ET AL: "LE COMMERCE ELECTRONIQUE: UN ETAT DE L'ART" ANNALES DES TELECOMMUNICATIONS - ANNALS OF TELECOMMUNICATIONS,CH,PRE SSES POLYTECHNIQUES ET UNIVERSITAIRES ROMANDES, LAUSANNE, vol. 53, no. 9/10, 1 September 1998 (1998-09-01), pages 361-376, XP000791619 ISSN: 0003-4347 page 12, right-hand column -page 13, left-hand column ---	1
A	SOMOGYI S: "MP3: A NEW AUDIO POWER - BUT WHOSE ?" AUDIO,US,AUDIO. PHILADELPHIA, vol. 82, no. 11, November 1998 (1998-11), page 20,22 XP000791991 ISSN: 0004-752X the whole document -----	1

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int tional Application No
PCT/US 00/09774

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0843449 A	20-05-1998	US 5889860 A	30-03-1999
		CA 2220457 A	08-05-1998
		JP 10301904 A	13-11-1998